REMARKS/ARGUMENTS

By the above amendment, applicants are amending the Claims to define an invention patentably over the prior art.

Previous Amendment (C)

Applicants are assuming these amendments (D) are cumulative to those requested in the prior amendment submitted as an RCE and labeled "Amendment C". Applicants still request the changes presented in that earlier amendment (C), which included a) a change to the title, b) changes to paragraphs in the specification, and c) withdrawal of changes requested to the drawings.

Drawing Requested on a Title Page

Applicants still request that FIG. 8 be used on the first page of a patent, if this application proceeds to issue.

Drawings (and claim 69)

No drawing changes are proposed, thus allowing the drawings to stand as originally filed. All earlier claims are cancelled, so applicants are not requesting any changes be made to the drawings to show "stacking", since the new claims do not make any claims on "stacking". Applicants trust that cancellation of the previous claims, in particular claim 69, will remove examiner's objection (his point #2) to the drawings. More specifically, applicants trust that they are no longer required to submit corrected drawings to show "a second similar apparatus resulting in a three dimensional array", as cited in claim 69, since this amendment cancels claim 69. Regarding examiner's point #4 however, for the record: paragraphs 013 and 061 of the original specification provide support for the "stacking" that had been claimed in claim 69, although claim 69 would have required an

edit to change "three dimensional" to "two dimensional" as that is the supported description, the one intended by the applicants, and the more proper description.

Claims

Cancel claims 57-87. Add new claims 88-111. Claims 88, 94, 99, 103, 105, and 109 are six independent claims, the same number of independent claims as in the originally filed application. Claim 107 is a multiple dependent claim dependent upon two claims. The total number of pending claims is now 24, but counts as 25. The original application had 36 claims with no multiple independent claims, while the RCE (Amendment C) was down to 31 claims with no multiple independent claims.

Arguments in Support of the New Claims:

In new claims 88-111, applicants present claims on side-by-side, side-polished, fiber-optic devices interconnected by the same unbroken, connectorless, spliceless fiber on which the side-polished devices are located. These claims are supported by the original disclosure and in particular by FIG. 8.

Examiner's cited reference, Mangel et al. (US 5,701,372), and within examiner's response point #6, clearly pictures in its figures 2 and 7 how its circuit of figure 1 can be implemented, both implementations relying on "butt joint connection" (col. 5, line 9) of separate chips and their waveguides. Applicants are distinguishing clearly over this prior art, represented by Mangel et al., with new claims 88-111 that include limitations to a length of a common and contiguous fiber, a never-broken fiber, or a fiber which is unbroken, connectorless, and spliceless. Furthermore, limitations within the new claims include the placement of the claimed side-polished areas side-by-side and therefore, not end-to-end along a common fiber and along a straight or jogged path.

Applicants argue that logical circuit interconnections should not be presented as prior art, as applicants' claims are to specific implementation structure and hardware. Applicants cannot find

any prior art that anticipates the physical structure of the new claims 88-111. Applicants argue that figure 4 of Farries (US 5,778,119) shows the serial interconnection of two fibers 120 and 121 which is not the continuation of a single, unbroken fiber. In column 5, on line 15, Farries, referring to his figure 4, describes two devices as being "serially interconnected", but this sheds no light on the physical construction of such an interconnection. Applicants argue that "serially interconnected" refers to a "logical" connection and that it imports no implications of structure other than that a light signal can pass from one fiber to the other. Regardless, Farries does not disclose, teach, or suggest methods on how to structure and position multiple, side-polished, fiber-optic devices onto a common substrate as applicants disclose and claim. Similarly, Tseng et al. (US 5,809,188) does not disclose, teach, or suggest the interconnection of side-polished sites along a common fiber. It is only the applicants who have been motivated to invented a structure and means with which to interconnect side-by-side, side-polished sites using the same unbroken and unspliced fiber that contains said sites.

Applicants have presented a new set of claims focused on the part of their apparatus invention that includes a segment of never-broken optical fiber to optically and seamlessly interconnect two regions of side-polish. Applicants' invention, claimed in these new claims a) does not resort to butting ends of fibers together to make a serial connection, b) does not resort to the use of a connector or a fused splice to make a serial connection, c) does not require alignment of the side-polished regions in a straight or jogged line along the fiber, and d) does not require the use of holes through the substrate. In contrast to our invention, Zhao et. al. accomplish interconnection between side-polished sites by weaving a fiber through holes in a supporting substrate and/or aligning side-polish sites in sequence along a generally straight or jogged path. Zhao et. al. does not disclose, teach, or suggest how to seamlessly interconnect a pair of side-polish sites spaced along a fiber when these sites are to be located alongside one-another, i.e. sideways to the direction of the fiber near side-polished sites.

Applicants recognize the importance of reducing substrate real estate and therefore of having side-by-side parallelism of interconnected, side-polished, fiber-optic devices. The side-by-side parallelism for interconnected devices is motivated by the relatively long interaction lengths

required of side-polished areas relative to the fiber diameter and the desire to avoid insertion losses inherent with interconnection of devices on separate fiber segments. Ferries's disclosure is totally disconnected of this motivation, as is that of Zhao et. al. also. Tseng's disclosures seem totally disconnected of any motivation to invent a way by which to interconnect side-polish devices, other than by evanescent coupling. Tseng's disclosures, and those of other's skilled in the art such as by Shaw, seem totally focused on the means by which to fabricate single 2-port and 4-port fiber-optic devices; they make no mention of any interest toward interconnecting them without the use of standard connectors, splices, or resorting to butted fibers or lensed coupling of fibers -- the techniques which are the standards of the prior art to interconnect pigtailed fibers (i.e. "broken" ends of a fiber). Magel (col 5, line 9 of US 5,701,372) teaches the butting of ends of two fibers, two waveguides, or a fiber and a waveguide.

Due to a lack of invention prior to applicant's own work and disclosure, side-polished fibers traditionally have remained in their polishing substrates, which are used thereafter as permanent support for the fibers. It would appear that prior skilled workers and inventors in the art have been mentally blocked by the notion that fibers used through the polishing process should have pigtails so that they can be kept short in order that the part of their lengths which are outside the confines of the substrate should not become damaged in the handling and polishing steps used in their manufacture.

The new claims presented are all directed to apparatuses and multi-device assemblies which have at least one pair of substrate-bound, side-by-side, side-polished, fiber-optic devices seamlessly and optically interconnected by way of a shared fiber that is free of breaks, butted connections, lensed couplings of fiber ends, connectors, or splices and generally unsupported between the pair. It is noted that any break, butted connection, lensed coupling of fiber ends, connector, or splice along an optical communication fiber can be detected simply and easily by visual inspection and will exhibit an optical loss component greater than 0.1dB that can be detected both optically and photo-electronically; such losses are undesirable in fiber-optic communication systems.

Applicants disclose, teach, and claim seamlessly interconnected regions of side-polished fiber placed side-by-side on a common substrate. This also differentiates from Zhao et al. (US Patent Application Publication No. US 2001/0055443), who only disclose and teach placement of multiple side-polished regions generally along a straight line or a jogged line. Zhao et al. do not address an important motivation to place these regions side-by-side in order to greatly reduce what is otherwise a critically large substrate and a subsequent high cost; how to accomplish this end is also not apparent to Zhao et al., Tseng et al., Mangle et al., Farries et al. or any other skilled in the prior art. The fact that the fiber-optics field is an extremely competitive and active one lends support to the argument that the applicants' invention, since it has not been disclosed previously or suggested or taught in prior art, is noteworthy, novel, and unobvious.

Applicants argue for examiner not to improperly take their inventive idea of seemless interconnectability of side-by-side, side-polished areas and combine it with prior art to reject their claims as obvious given their own invention. Applicants can find no example, teaching, or suggestion in the prior art (including the cited references) that anticipates the new claims, or any combination of prior art that would suggest the new claims. Again, applicants argue that logical circuit interconnections should not be taken to suggest particular structure or physical implementation for implementation hardware, and in this case, not beyond the effecting of an interconnection of the signal which is transported by the hardware (the fiber(s)).

Regarding examiner's point #7 on claim 69, applicants are canceling 69 along with all other previous claims, so this rejection is thereby addressed. However, applicants wish to again assert that Mangel's butted interconnects do not anticipate applicants' invention of a way to effect multiple side-polished sites, positioned along-side of one-another, on a common length of fiber which has never been broken or spliced and which does not use connectors or butting of ends of fibers.

Conclusion

For all of the above reasons, applicants submit that the accumulated amendments of the specification by way of amendments "A", "B", and "C", together with the new set of claims presented with this amendment "D", now put the specification into proper form, and that newly presented claims 88-111 particularly point out and distinctly claim at least one invention of applicants' disclosure that is novel and unobvious over the prior art. These claims are fully supported by the specification. Therefore applicants submit that this application is now in condition for allowance, which action they respectfully solicit.

Conditional Request For Constructive Assistance

Applicants are amending the specification and claims of this application so that they are proper, definite, and define novel structure that is also unobvious. If for any reason this application is not believed to be in full condition for allowance, these applicants respectfully request the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. § 2173.02 and § 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

Very Respectfully,

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